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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/699,061 | 10/31/2003 | Ben D. Roberts | ITL.103US (P17101) | 2582 |

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Timothy N. Trop
TROP, PRUNER & HU, P.C.
Suite 100
8554 Katy Freeway
Houston, TX 77024

EXAMINER

TRA, TUYEN Q

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2873

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/699,061 | Applicant(s) ROBERTS, BEN D. | |
| | Examiner Tuyen Q Tra | Art Unit 2873 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,8,11,12,14,16,18,21,22,24,26 and 29-32 is/are rejected.
- 7) ☒ Claim(s) 3,5,7,9,10,13,15,17,19,20,23,25,27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The Drawings filed on 10/31/03 have been declared formal by the examiner.

Claim Objections

2. Claim 20 is objected to because of the following informalities:

Claim 20 should be depend on claim 11. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 31 and 32 recites the limitation "the processor" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

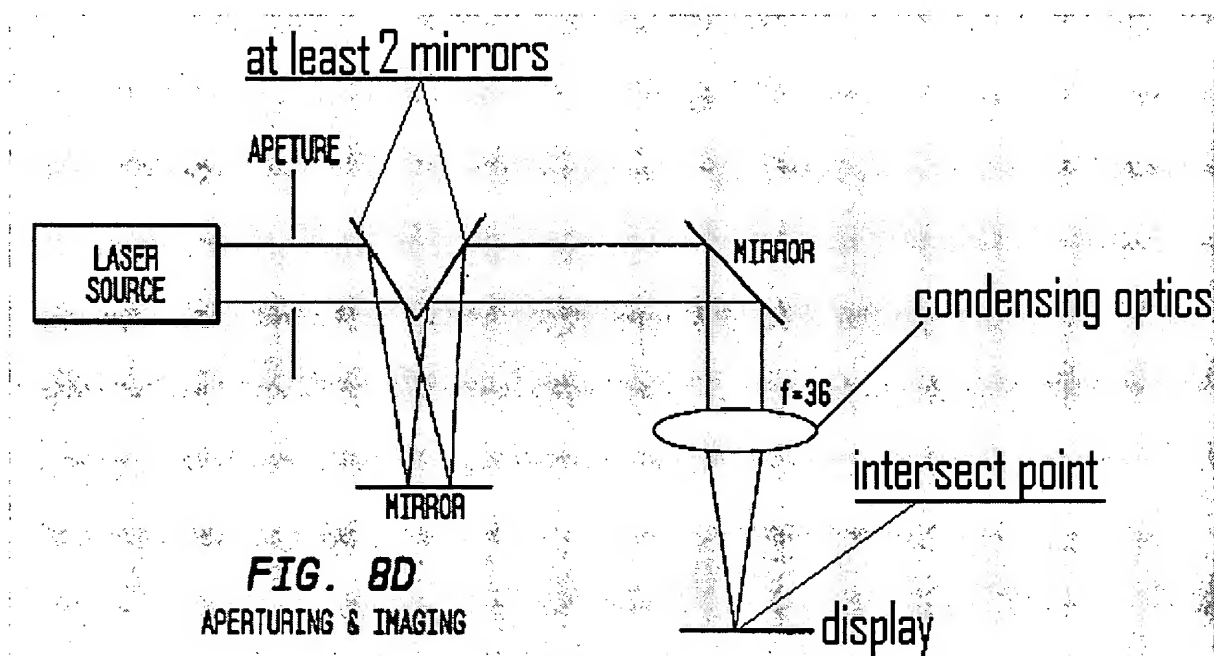
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 2, 4, 6, 8, 11, 12, 14, 16, 18, 21, 22, 24, 26 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Brandinger et al. (U.S. Pat.6,605,796 B2).

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a) With respect to claims 1 and 11, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (see below Figures).



b) With respect to claim 21, Brandinger et al. discloses in Figure 8D comprising of condensing optics, a mirror array; and a circuit to, for each pixel, control the mirror array to selectively direct reflected light from the mirror array into the condensing optics from at least two mirrors of the array to regulate an intensity of the pixel (Figure 1 illustrated an controller for DMD as a computer controller, col. 5, lines 5-9 discloses purpose of modulating intensity of mirror pixels).

c) With respect to claims 2, 12 and 22, Brandinger et al. further discloses in Figure 8D wherein, for each pixel, the circuit controls the mirror array to selectively tilt the at least two

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mirrors to reflect light into an optical path that intersects a location of the pixel to regulate the intensity of the pixel.

d) With respect to claims 4, 14 and 24, Brandinger et al. further discloses in Figure 8D

wherein each pixel of the projected image is uniquely associated with at least two mirrors of the array.

e) With respect to claims 6, 16 and 26, Brandinger et al. further does not disclose the use of pulse width modulation to regulate the intensity of each pixel.

f) With respect to claims 8 and 18, Brandinger et al. further discloses in Figure 8D wherein optics to, for each pixel, merge optical paths extending from said at least two mirrors into a single optical path that intersects a location of the pixel.

g) With respect to claim 30, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a computer in Figure 1A and inherently there is storage medium for storing instructions to cause computer to control a mirror array to produce a projected image, and for each pixel of the image control the mirror array to selectively direct reflected light from the mirror array in an optical path toward the projected image from at least two mirrors of the array to regulate an intensity of the pixel.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandinger et al. (U.S. Pat. 6,605,796 B2) in view of Hewlett(U.S. 6,771,411 B2).

a) With respect to claim 29, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (see below Figures).

However, Brandinger et al. does not disclose a processor coupled to the mirror array and a flash memory storing instructions for processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor and a flash memory for storing instructions for the processor to control the mirror array (see Figure 5).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Brandinger et al., with a processor and a flash memory used for storing instruction to control the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

b) With respect to claim 31, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a computer in Figure 1A and inherently there is storage medium for storing instructions to cause computer to control a mirror array to produce a projected image, and for each pixel of the image control the mirror array to selectively direct reflected light from the mirror array in an optical path toward the projected

image from at least two mirrors of the array to regulate an intensity of the pixel and the reflected light toward a condensing optic.

However, Brandinger et al. does not disclose a processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor for controlling the mirror array (see Figure 5).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Brandinger et al., with a processor for controlling the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

Allowable Subject Matter

8. Claims 3, 5, 7, 9, 10, 13, 15, 17, 19, 23, 25, 27 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The reason for the indication of allowable subject matter is that (claims 3, 13, 23) wherein, for each pixel, the circuit controls the mirror array to cause a greater number of said of at least two mirrors to reflect light into the optical path for a higher intensity level than a number of said of at least two mirrors that reflect light into the optical path for a lower intensity level; (claims 5, 15, 25) each pixel of the projected image is associated with a number of mirrors of the array substantially equal to the number of potential gray levels of the pixel; (claims 7, 17, 27) a first dimension of the array is associated with pixel positions of the projected image and a different second dimension of the array is associated with intensity

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values for the pixels; (claims 9, 19) the optics compresses a two-dimensional image formed from light reflected from the mirror array into a one-dimensional sub-image of the projected image; (claims 10, 28) for each pixel, the intensity of the pixel is indicated by a multiple bit digital value and mirrors of the array are organized into different groups, each group of minors being associated with a different bit of the digital value;

9. Claim 20 would be allowable if rewritten to overcome the Claim Objection set forth in this Office action and to include all of the limitations of the base claims and any intervening claims. The reason for the indication of allowable subject matter is that, for each pixel, the intensity of the pixel is indicated by a multiple-bit digital value and the mirrors of the array are organized into different groups, each group of minors being associated with a different bit of the digital value.

10. Claim 32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The reason for the indication of allowable subject matter is that further comprising instructions to cause the processor to group mirrors of the array into groups of multiple mirrors, each group being associated with a different pixel of the projected image and the mirrors of each group collectively forming a gray scale intensity for the associated pixel disclosed in the claims is not found in the prior art.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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(U.S. 6,231,193B1) discloses a light source device, illuminating system and image projecting apparatus in Figure 5 comprising of mirrors (8,9,10) a light source (2), condensing lens (12), and display screen (13), wherein intersect point of reflected light from the mirrors (8, 9, 10) is on the pixel screen (13).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (571) 272-2343. The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (571) 272 - 2328. The fax number for this Group is (703) 872-9306.

tt

August 10, 2004


Hung Xuan Dang
Primary Examiner